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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/847,390 | 05/02/2001 | Ming C. Hao | 10003407-1 | 6484 |

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| EXAMINER |
|---|
| CHANNAVAJJALA, SRIRAMA T |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2177 | 4 |

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/847,390 | HAO ET AL. | |
| | Examiner | Art Unit | |
| | Srirama Channavajjala | 2177 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *02 May 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings filed on 5/2/2001 are objected to by the Draftsperson under 37 CFR 1.84 or 1.152.

### *Information Disclosure Statement*

2. In the specification, at page 4, 12,16, applicant cited number of references, applicant is hereby required to submit PTO-1449 in response to this office action, paper no. # 4.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-14,16,19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunjan K Gupta et al., [hereafter Gupta], Detecting seasonal trends and cluster motion visualization for very high dimensional transactional data, proceedings of first international SIAM conference on Data Mining (SDM01), April, 2001, pp 1-18, in view of Agrawal et al., [hereafter Agrawal], US Patent No. 5794209.

4. As to Claim 1, 11, 13, Gupta teaches a system which including 'visualizing information' [see Abstract], 'receiving information having plurality of items' [page 2, line 33-36], plurality of items corresponds to data set having 10,000 or more products as detailed in page 2, line 33-35, 'generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item' [page 11, item 5.2, fig 4a-4b], Gupta specifically directed to generating three dimensional graph with respect to data clusters as detailed in fig 4a-4b, 'constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items' [page 11, item 5.2, page 13, line 1-14], 'relaxing the graph, wherein after relaxation the graph converges to a state of local minimal energy, wherein the distance between a pair of items represents the frequency of the item set in the transaction data' [page 14, fig 7-8], 'association directions between the items in the transaction data' [page 10, line 5-36]. It is however, noted that Gupta does not specifically teach' employing a directed edge to

represent the association confidence levels'. On the other hand, Agrawal disclosed 'employing a directed edge to represent the association confidence levels' [col 3, line 53-62], Agrawal specifically directed to user-defined minimum support confidence level with respect to large item sets and subsets as detailed in col 3, line 53-62.

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate Agrawal et al., into detecting seasonal trends and cluster motion visualization for very high dimensional transactional data of Gupta et al., because both are directed to knowledge discovery with respect to user or customer transactions or purchasing, more specifically Gupta is directed to transactional data particularly e-commerce business data presented in a visualization schemes [see Abstract], while Agrawal et al., is directed to quickly mining association rules in databases, more specifically, discovering consumer purchasing tendencies that specifically identifies customer transaction item sets that are stored in a database [see Abstract]. One of the ordinary skill in the art the time of applicant's invention to combine the references because that would have allowed uses of Gupta to implement computer program product that selects specific subsets of itemsets and satisfies the minimum confidence criteria defined by the user, further satisfies rules associated the discovering trends between item set recurrence at least equals user-defined confidence as suggested by Agrawal et al., [see Abstract, col 3, line 45-62], thus improving accuracy and performance of data analysis.

5. As to claim 2, 14, Agrawal disclosed 'generating a confidence matrix for defining the confidence level of each association' [col 4, line 15-25].

6. As to Claim 3, Agrawal disclosed 'receiving a user-defined minimum confidence level' [col 3, line 54-62], 'displaying items having an association with a confidence level that is in a predetermined relationship with the user-defined minimum confidence level' [fig 2, col 6, line 5-18].

7. As to Claim 4, Agrawal disclosed 'receiving a plurality of items' [col 6, line 6-7], 'receiving internet transaction data' [col 5, line 48-51, line 53-61], 'transactions, products, transactions' [col 7, line 25-40].

8. As to Claim 5, 12, Agrawal disclosed 'plurality of transactions, where each transaction includes one or more items' [col 7, line 41-45]. On the other hand, Gupta disclosed 'generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item, organizing the itmes based on how frequently the items appear in transactions' [page 8, item 4.2], 'specifying the initial position of each item in one of a random fashion and a predetermined fashion' [page 10, line 5-37].

9. As to Claim 6, the limitation of this claim have been noted in the rejection of above claim 5. In addition, Gupta disclosed 'distributing the items equally on a spherical surface, wherein tightness is a sum of all supports from a current item to directly

adjacent items, and wherein more tightly related items are disposed in the center of the sphere and the less tightly related items are evenly distributed around the center' [page 11, item 5.2, fig 4a-4b].

10. As to Claim 7, the limitation of this claim have been noted in the rejection of above claim 6. In addition, Gupta and Agrawal both teach statistical analysis of large data sets [see Gupta: Abstract; Agrawal: Abstract], Gupta also teaches 'distributing the items equally on a spherical surface [see fig 4a-4b]. It is however noted that sampling of data sets are integral part of both Gupta and Agrawal's teaching because they are directed to sampling of data sets. It is noted that sampling is based on stochastic sampling, more specifically based on Poisson distribution is common knowledge in the art, further Poisson disc sampling is based on Poisson distribution with minimum-distance constraint between samples either added or removed points at random to any previous points.

11. As to Claim 8, Gupta disclosed 'frequency matrix includes a plurality of elements, wherein each element includes the frequency of occurrence of the association in all transactions after normalization' [fig 4, page 11, item 5.2], Gupta specifically directed to position matrix that specifically indicate at least trends discovered using visualization.

12. As to Claim 9-10, the limitation of this claim has been noted in the above claim 8. In addition, Gupta disclosed 'three-dimensional sphere wherein the distance between each pair of items represents the support therebetween' [see fig 4].

13. As to Claim 16, Gupta disclosed 'market basket analysis application' [see Abstract].

14. As to Claim 19-20, Agrawal disclosed 'text mining application' [see Abstract, fig 1]

15. Claims 15,17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunjan K Gupta et al., [hereafter Gupta], Detecting seasonal trends and cluster motion visualization for very high dimensional transactional data, proceedings of first international SIAM conference on Data Mining (SDM01), April, 2001, pp 1-18, Agrawal et al., [hereafter Agrawal], US Patent No. 5794209 as applied to Claim 1,11 above, further in view of Ratnavale et al., [hereafter Ratnavale], WO 01/08072A1

16. As to Claim15, Gupta disclosed 'visually associate product affinities and relationships' [see fig 4-6], while Agrawal teaches large itemsets related to transaction data [see Abstract], however, it is noted that both Gupta and Agrawal do not specifically teach 'electronic commerce web site, products for sale'. On the other hand Ratnavale disclosed 'electronic commerce web site, products for sale' [see Abstract, fig 6-7].

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate teaching of Ratnavale into detecting seasonal trends and cluster motion visualization for very high dimensional transactional data of Gupta et al., and quicly mining association rules in databases of Agrawal et al., because that would have allowed users of Gupta,Agrawal to access interactive market system via world wide web or internet based product sales and services of Ratnavale [see Abstract, fig 1], further bringing the advantages of multiple buyers, vendors to customize the market to meet their individual needs in real-time via Internet as suggested by Ratnavale [page 3, line 12-16].

17. As to Claim 17-18, Ratnavale disclosed 'telecommunications , network traffic analysis application [page 7, line 20-28, fig 1].

18. Claims 1,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gunjan K Gupta et al., [hereafter Gupta], Detecting seasonal trends and cluster motion visualization for very high dimensional transactional data, proceedings of first international SIAM conference on Data Mining (SDM01), April, 2001, pp 1-18, in view of Mohammed Javeed Zaki et al., [hereafter Zaki], Evaluation of sampling for data mining of association rules, 7th Wkshp.Resrch.Iss.Data Engg, 1996, pp1-9

19. As to Claim 1, 11, Gupta teaches a system which including 'visualizing information' [see Abstract], 'receiving information having plurality of items' [page 2, line 33-36], plurality of items corresponds to data set having 10,000 or more products as detailed in page 2, line 33-35, 'generating a graph of the items by arranging the items on a spherical surface to specify an initial position of each item' [page 11, item 5.2, fig 4a-4b], Gupta specifically directed to generating three dimensional graph with respect to data clusters as detailed in fig 4a-4b, 'constructing a frequency matrix for defining a stiffness measure of a spring attached to each pair of items' [page 11, item 5.2, page 13, line 1-14], 'relaxing the graph, wherein after relaxation the graph converges to a state of local minimal energy, wherein the distance between a pair of items represents the frequency of the item set in the transaction data' [page 14, fig 7-8], 'association directions between the items in the transaction data' [page 10, line 5-36]. It is however, noted that Gupta does not specifically teach' employing a directed edge to represent the association confidence levels'. On the other hand, Zaki disclosed 'employing a directed edge to represent the association confidence levels' [page 6, col 1, item 4.4, col 2, fig 5].

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate Zaki et al., into detecting seasonal trends and cluster motion visualization for very high dimensional transactional data of Gupta et al., because both are directed to data analysis, more specifically Gupta is directed to transactional data particularly e-commerce business data presented in a visualization

schemes [see Abstract], while Zaki et al., is directed to Evaluation of sampling for data mining of association rules, more specifically, sampling, analyzing large volumes of transactional business data using association rules [see Abstract]. One of the ordinary skill in the art the time of applicant's invention to combine the references because that would have allowed uses of Gupta to effectively sampling the various transactional related data, more specifically sampling item set size and large item sets for stabling accuracy measurements, further establishing confidence levels between various sampling data sets as suggested by Zaki et al., [see page 2, col 2, sampling algorithm, fig 2, page 6, col 1, item 4.4], thus improving accuracy and performance of data analysis.

***Conclusion***

**The prior art made of record**

a. Gunjan K Gupta et al., Detecting seasonal trends and cluster motion visualization for very high dimensional transactional data, proceedings of first international SIAM conference on Data Mining (SDM01), April, 2001, pp 1-18

b. Mohammed Javeed Zaki et al., Evaluation of sampling for data mining of association rules, 7th Wkshp.Resrch.Iss.Data Engg, 1996, pp1-9

c. US Patent No. 5794209

d. WO 01/08072A1

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

e. US Patent No. 6141006

f. US Patent No. 6225998

g. US Patent No. 6157705

h. US Patent No. 6292784

i. US Patent No. 6334110

j. US Patent No. 2002/0087679

k. WO 01/80098

l. EP0610581A2

m. EP1077413A2

n. Paulo B et al., Mining web access logs of an On-line newspaper, pp1-8

o. Mihael A, Visual data mining with Pixel-oriented visualization techniques, pp1-8

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Srirama Channavajjala whose telephone number is (703) 308-8538. The examiner can normally be reached on Monday-Friday from 8:00 AM to 5:30 PM Eastern Time. The TC2100's Customer Service number is (703)306-5631.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene, can be reached on (703) 305-9790. The fax phone numbers for the organization where the application or proceeding is assigned are as follows:

703/746-7238 **(After Final Communication)**

**703/746-7239** **(Offical Communications)**

703/746-7240 **(For Status inquiries, draft communication)**

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-9600.

sc
*Patent Examiner.*
August 13, 2003.